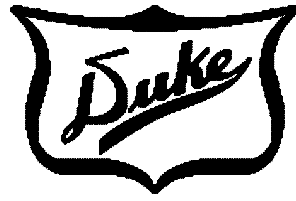
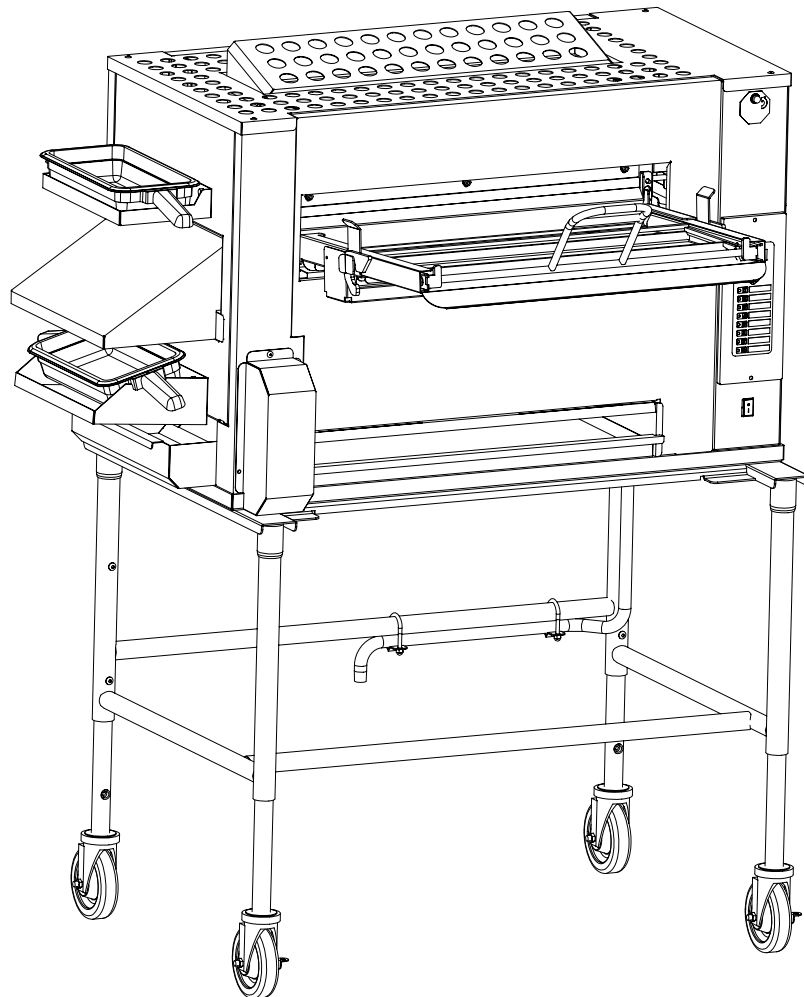


# Troubleshooting Manual



## FLEXIBLE BATCH BROILER



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# Troubleshooting FlowChart

## Quick Index

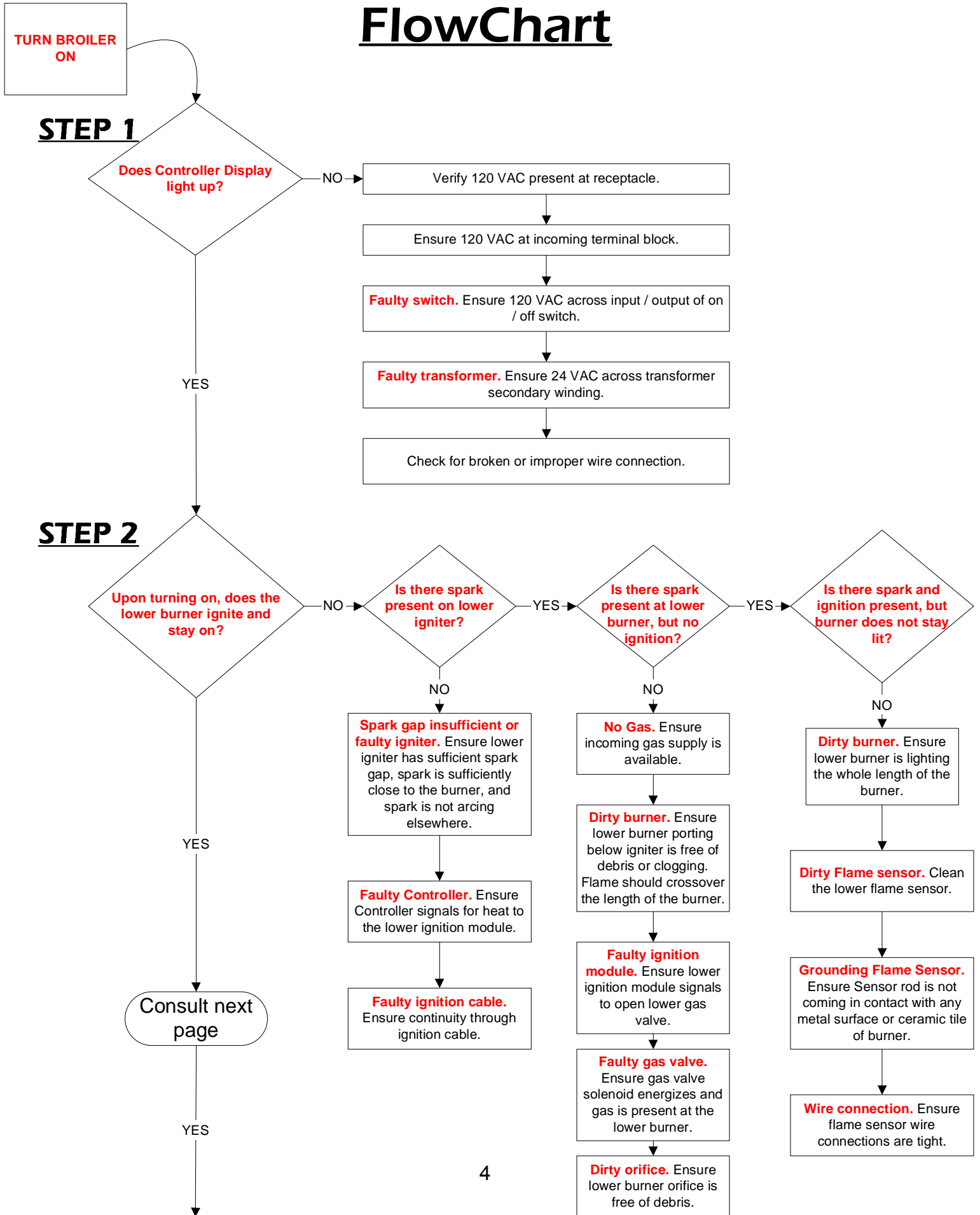
### Define the Problem...

#### Complaint...

#### Consult STEP...

1	Display flashing "gAS" and....	bot	toP	SEnb	SEnt
		STEP 2	STEP 3	STEP 2	STEP 3
2	Display flashing "tESt" and "Prod"	STEP 2-3 and 6			
3	Display showing "Hi"	STEP 2			
4	Display showing "Lo"	STEP 2			
5	Display showing "Prob"	Faulty Probe. Test and replace probe.			
6	Conveyor jammed / running all the time	STEP 7			

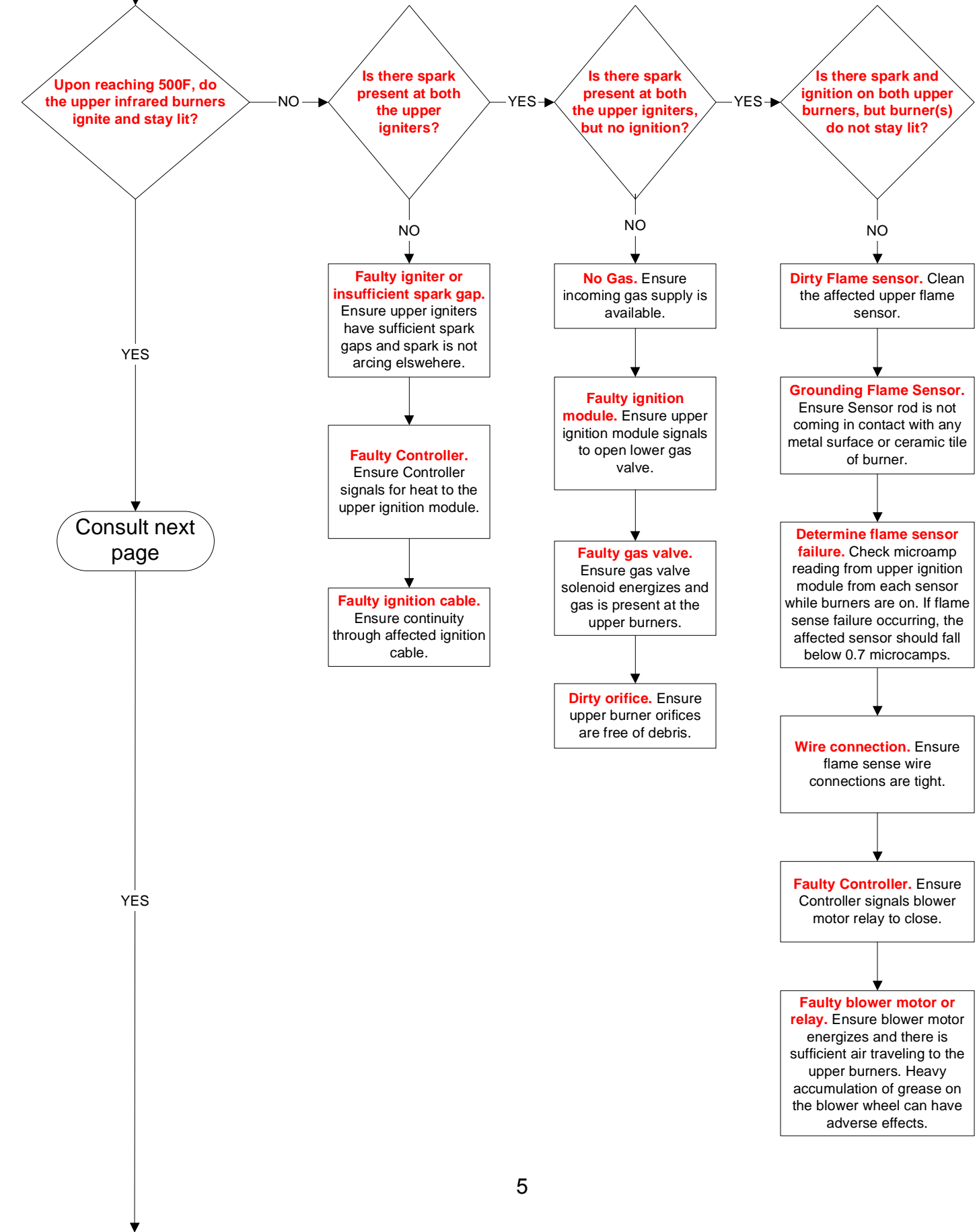
# Troubleshooting FlowChart



# Troubleshooting

## FlowChart

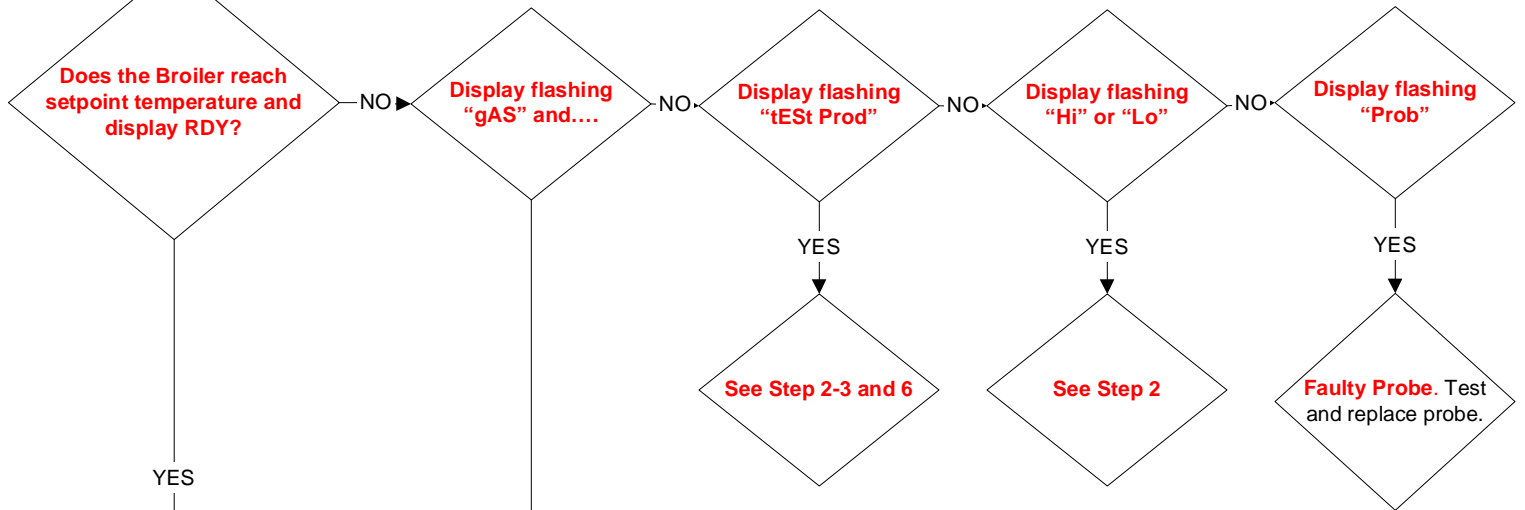
### STEP 3



# Troubleshooting

## FlowChart

### STEP 4



### **SEE STEPS 2-3**

**gAS bot** = Failure of bottom sensor to sense flame during **Preheat** mode

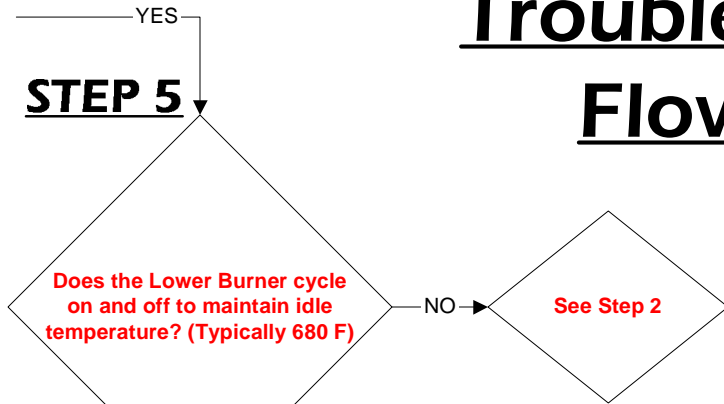
**gAS toP** = Failure of a top sensor to sense flame during **Preheat** mode

**gAS Senb** = Failure of bottom sensor to sense flame during **rdY** mode

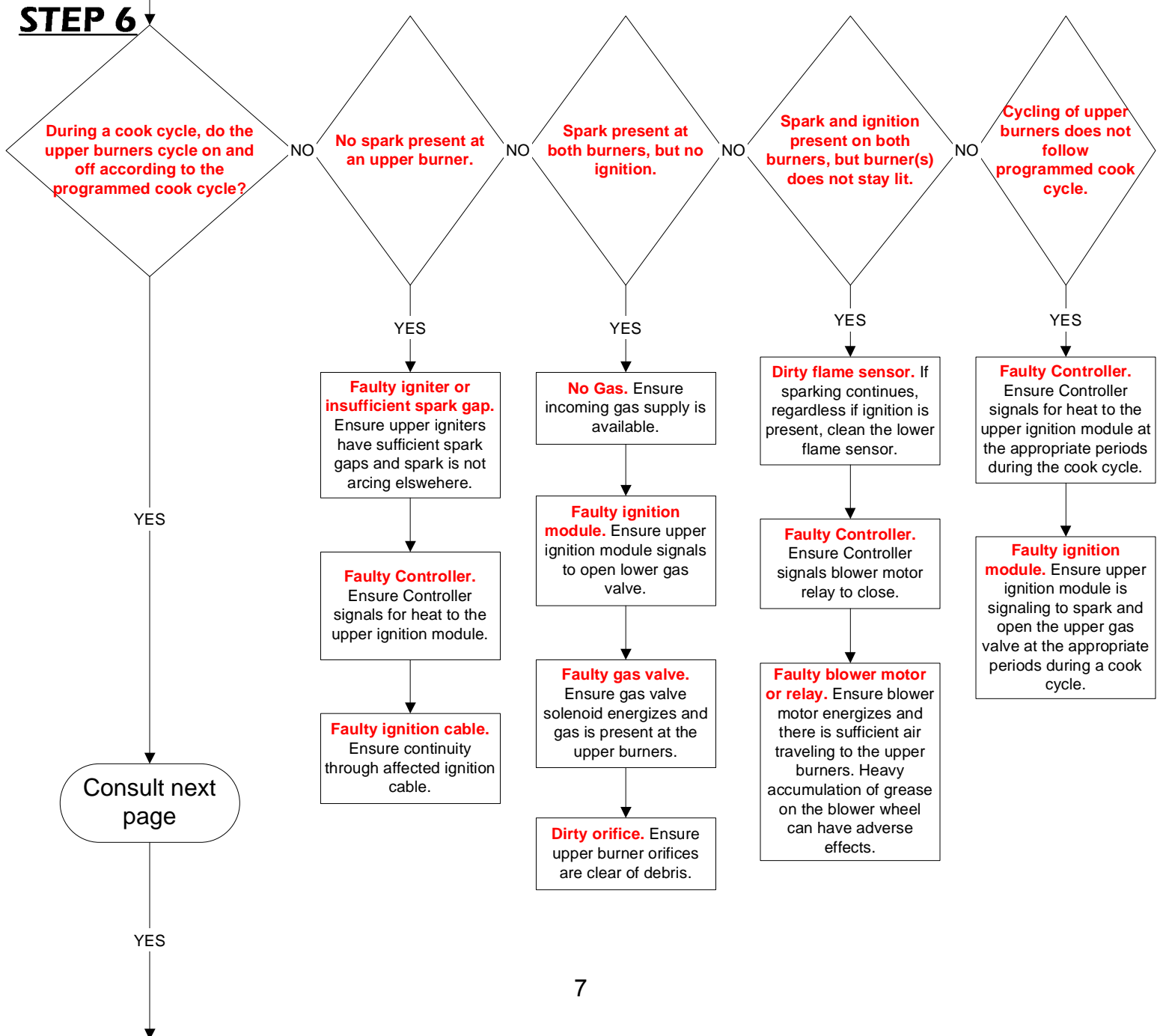
**gAS Sent** = Failure of a top sensor to sense flame during **rdY** mode

# Troubleshooting FlowChart

## STEP 5

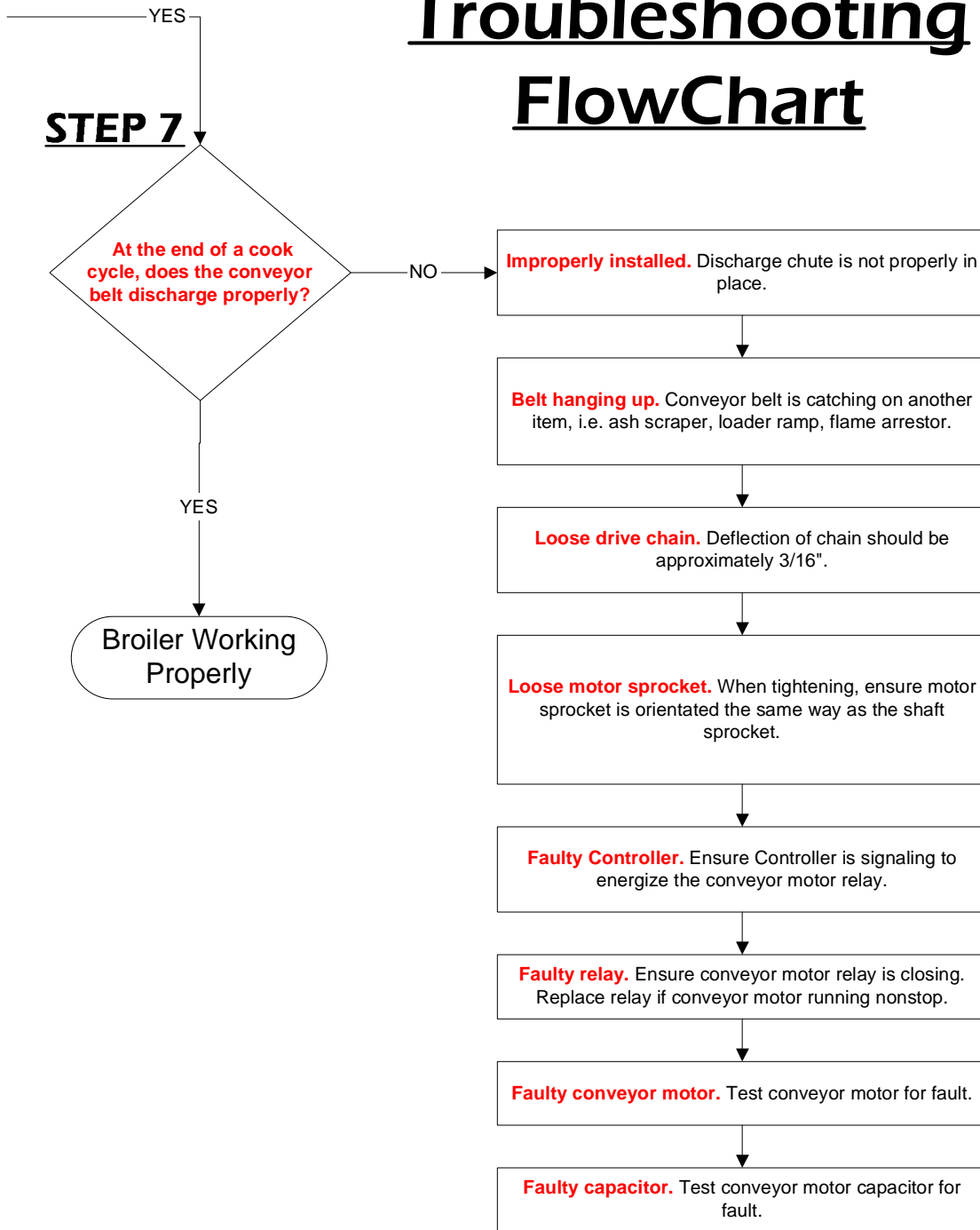


## STEP 6



# Troubleshooting

## FlowChart

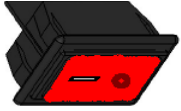
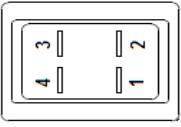
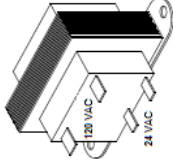
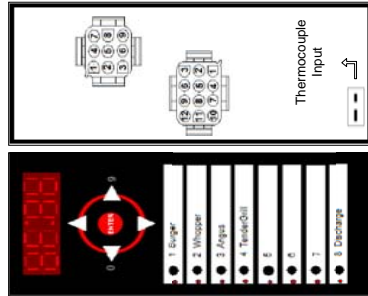
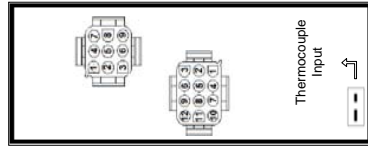
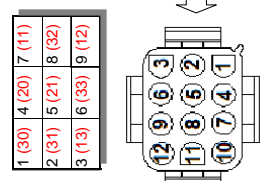
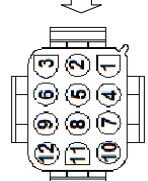
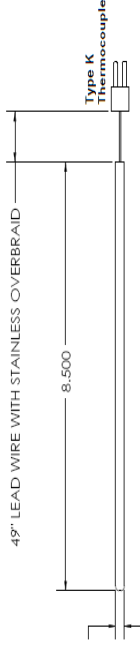




# COMPONENT GUIDE

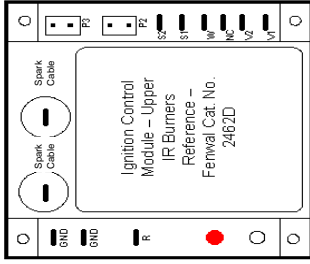
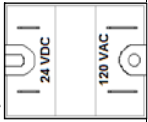
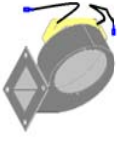
Power on

Sequence Of Events

Component	Input Voltage Check	Output Voltage Check	Resistance and Various Tests (With test leads disconnected)
<b>Power Switch</b> 	120 VAC across wires 1 & 2	120 VAC across wires 3 & 4	
<b>Wires Numbers</b> 			
<b>Transformers</b> 	120 VAC across primary winding	24 VAC across secondary winding to Control	Approximately, Primary - 21.8 ohms Secondary - 0.8 ohms
<b>Controller</b> <b>FRONT</b>  <b>BACK</b> 	<b>BACKSIDE - TOP</b>  <b>BACKSIDE - BOTTOM</b> 	Wires 11 & 12 - Input Power 24 VAC Wires 14 & 18 - Input Detect Lower Valve Open Signal 24 VAC Wires 14 & 15 - Input Detect Upper Valve Open Signal 24 VAC Wires 13 & 14 - Input Detect Upper Ignition Module Power 24 VAC  Wires 30 & 33 - Output Cook Light 24 VDC Wires 30 & 31 - Output Conveyor Motor Relay 24 VDC Wires 30 & 32 - Output Blower Motor Relay 24 VDC Wires 14 & 20 - Output Lower Ignition Module Call for Heat 24 VAC Wires 14 & 21 - Output Upper Ignition Module Call for Heat 24 VAC	
<b>Thermocouple Probe</b> 			Test for open or shorted condition.

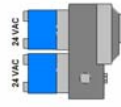
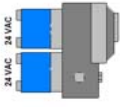
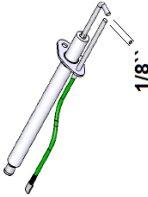
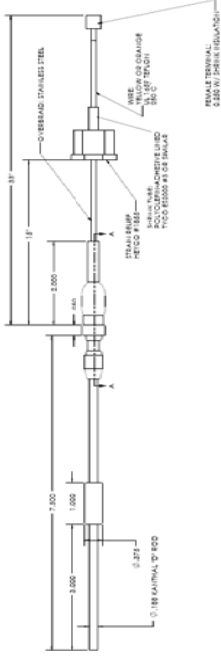
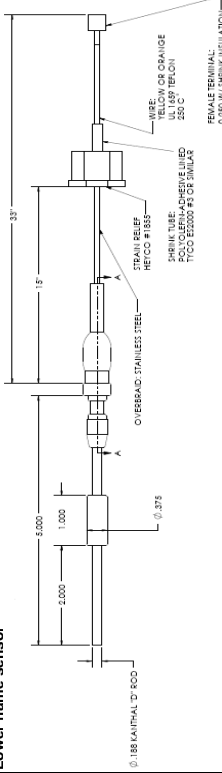
# COMPONENT GUIDE

## Ignition and Flame Recognition

Sequence Of Events	Component	Input Voltage Check	Output Voltage Check	Resistance and Various Tests (With test leads disconnected)
4	 <p>Lower Ignition Module</p>	<p>Power - 24 VAC across TH &amp; GND from Controller</p> <ul style="list-style-type: none"> <li>Diagnostic LED</li> <li>Flash indication will occur immediately after the failure.</li> <li>2 flashes = Have flame, but no call from heat across TH &amp; GND</li> <li>3 flashes = Ignition Lockout ( only after 3 unsuccessful attempts to ignite and sense flame.</li> <li>24 second ignition attempt</li> <li>5 second interpurge</li> <li>Sparkling will stop if flame sense measures above 0.7 microamps.</li> </ul>	<p>24 VAC across V1 &amp; V2 to lower gas valve</p> <p>Bottom Flame sensor measurement terminals</p> <p>P2 =</p>	
4	 <p>Upper Ignition Module</p>	<p>Power - 24 VAC across R &amp; GND from right side transformer</p> <ul style="list-style-type: none"> <li>Diagnostic LED</li> <li>Flash indication will occur once immediately after the failure.</li> <li>1 flash = Powering on</li> <li>2 flashes = Have flame, but no call from heat across TH &amp; GND</li> <li>3 flashes = Ignition Lockout ( only after 2 unsuccessful attempts to ignite and sense flame.</li> <li>4 flashes = Valve relay lockout (indication of internal module failure)</li> <li>24 second ignition attempt</li> <li>5 second interpurge</li> <li>Sparkling will stop if flame sense measures above 0.7 micro amps.</li> </ul>	<p>24 VAC across V1 &amp; V2 to upper gas valve</p> <p>Left Flame sensor measurement terminals</p> <p>Flame sensor measurement terminals</p> <p>P3 = Front P2 = Rear / Right</p>	
4	 <p>Blower motor relay</p>	<p>24 VDC across wires 30 &amp; 32 from Control</p>	<p>120 VAC across wires 4 &amp; 6</p>	<p>With 24 VDC input, 120 VAC across output</p> <p>With 0 VDC input, approximately 0 VAC across output.</p>
4	 <p>Blower motor</p>	<p>120 VAC across motor leads</p>	<p>Running motor</p>	<p>Approximately 22.2 ohms</p>

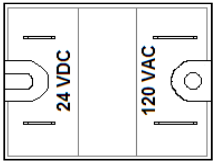
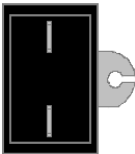
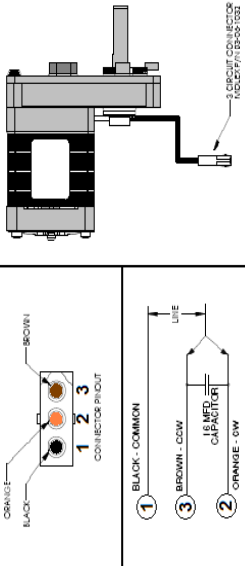
# COMPONENT GUIDE

## Ignition and Flame Recognition, Continued

Sequence Of Events	Component	Input Voltage Check	Output Voltage Check	Resistance and Various Tests (With test leads disconnected)
5	 <p>Lower Gas Valve</p>	24 VAC across each solenoid from lower ignition module	Test pressure tap for open valve with manometer	
5	 <p>Upper Gas Valve</p>	24 VAC across each solenoid from upper ignition module	Test pressure tap for open valve with manometer	
6	 <p>Lower / Upper Igniters</p>			Measure 1/8" spark gap
7	 <p>Upper flame sensors</p>			Closed, continuity from rod tip to terminal
7	 <p>Lower flame sensor</p>			Closed, continuity from rod tip to terminal

# COMPONENT GUIDE

## End of Cook Cycle

Sequence Of Events	Component	Input Voltage Check	Output Voltage Check	Resistance and Various Tests (With test leads disconnected)
8	<b>Conveyor motor relay</b> 	24 VDC across wires 30 & 31 from Control	120 VAC across wires 4 & 5	With 24 VDC input, 120 VAC across output With 0 VDC input, approximately 0 VAC across output.
8	<b>Conveyor motor start capacitor</b> 			Discharge capacitor. Resistance should measure low and drift to high ohms.
8	<b>Conveyor motor</b> 	120 VAC across motor leads	While motor is free of drive chain, motor should run	Approximately, Black - Orange = 24.2 ohms Black - Brown = 24.2 ohms Orange - Brown = 49.2 ohms Continuity from motor lead to motor casing would indicate a shorted winding



# TROUBLESHOOTING – Quick Reference

## NORMAL OPERATING CODES

**rdy**  
READY TO COOK

**Pr-E**  
WAIT, BROILER PRE-HEATING

**Lo**  
TEMPERATURE TOO LOW  
WAIT, UNTIL READY TO COOK

**Hi**  
TEMPERATURE TOO HIGH,  
CALL FOR SERVICE

## OTHER MAINTENANCE CODES

**Pr-ab**  
TEMPERATURE PROBE  
MALFUNCTIONING,  
CALL FOR SERVICE

## Product Cookout Adjustments

PRESS AND HOLD  
TOP AND BOTTOM  
ARROW BUTTONS  
FOR 3 SECONDS,  
**Pr-d** "WILL DISPLAY

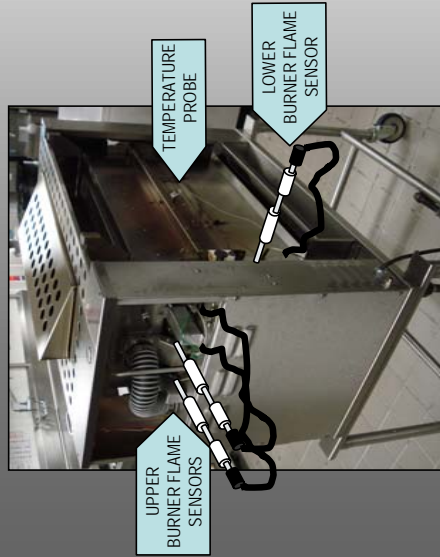
PRESS DESIRED  
PRODUCT KEY FROM  
KEYPAD TO ADJUST  
COOKOUT

TO CHANGE PRODUCT  
TEMPERATURES, PRESS  
MARKED ARROWS:  
INCREASE = LONGER COOK TIME  
DECREASE = SHORTER COOK TIME

PUSH BK LOGO (ENTER)  
BUTTON TWO TIMES  
TO EXIT

## Burner Flame Sensors

Remove end and back body panels for access to sensors



## ALARMS

PRESS ANY KEY TO SILENCE BUZZER

**TEST**

**Pr-ab**  
TEST PRODUCT

**Gas**

**Top**  
TOP BURNER  
FLAME SENSOR - TOP

**SEnb**  
FLAME SENSOR - BOTTOM

**bot**  
BOTTOM BURNER

If the following actions do not resolve  
broiler issues – consult with maintenance  
personnel or call Duke Manufacturing Co.  
for service 1-800-735-3853

## ACTIONS

- PRESS BK LOGO BUTTON
- CHECK PRODUCT TEMPERATURES
- IF PROBLEM PERSISTS, CLEAN UPPER & LOWER FLAME SENSORS AND LOWER BURNER

- PRESS BK LOGO BUTTON
- "PULL OUT" UPPER FLAME SENSORS
- CLEAN CERAMIC PART OF FLAME SENSORS
- "PUSH IN" UPPER FLAME SENSORS
- PRESS BK LOGO BUTTON
- CHECK TO SEE THAT UPPER BURNERS ARE LIGHTING WHILE IN READY MODE
- IF "GAS + TOP" ONLY IS INDICATED, TURN BROILER OFF/ON TO RESET



UPPER BURNERS TURNED ON

- PRESS BK LOGO BUTTON
- "PULL OUT" LOWER FLAME SENSOR
- CLEAN CERAMIC PART OF FLAME SENSOR
- "PUSH IN" LOWER FLAME SENSOR
- PRESS BK LOGO BUTTON
- CHECK TO SEE THAT LOWER BURNER IS LIGHTING WHILE IN READY MODE, IF NOT LIGHTING; CLEAN & DRY BURNER AND CLEAN & DRY SENSOR TUBE
- IF "GAS + BOT" ONLY IS INDICATED, TURN BROILER OFF/ON TO RESET



LOWER BURNER TURNED ON